• COLORADO RIVER •

AQUEDUCT NEWS

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Vol. 1 JUNE 5, 1934 No. 10

COLORADO RIVER AQUEDUCT SURVEYORS

Checking center line of conduit to be built east of San Jacinto tunnel, with Mt. San Jacinto in the background.

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AQUEDUCT NEWS
THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA
LOS ANGELES, CALIFORNIA

Published twice monthly in the interest of Field and Office Workers on the Colorado River Aqueduct, and for the information of all other citizens of the Metropolitan Water District.

Vol 1 June 5, 1934 No. 10

A DRAMATIC PARALLEL

Far be it from the NEWS to indulge in unnecessary heroics over the more dramatic phases of the Colorado River Aqueduct project on which its readers are engaged—since the NEWS well knows that engineers and construction men, on the whole, are not fond of heroics as far as their job is concerned.

Perusal of R. M. Merriman's highly interesting articles on the water supply systems of ancient and modern Athens, however, reveals a dramatic parallel too striking to be ignored.

Mr. Merriman points out that in Greece the "climate and topography are similar to those of Southern California; the rainfall is meagre, fifteen to twenty inches per year, all of which falls during the three or four winter months; and, due to the scarcity of vegetation on the mountains, the run-off is very great."

He goes back into history more than 2000 years, and traces the amazing parallel between the welfare and prosperity of the Athenians and the condition of their water supply.

Surely, the facts of history in this case contain an object lesson for the citizens of our own Southern California—a lesson which is being heeded, as is evidenced by the Great Colorado River Aqueduct.

READ CAREFULLY

The NEWS, in this issue, devotes considerable space to the recently amended constitution of the Metropolitan Water District Employees' Association and the election which will be held in the near future.

Incumbent members of the Board worked long and hard in altering the constitution in such a way as to give the various employee groups within the District organization more direct representation and control of their local affairs. Whether or not this effort was worth the candle remains to be seen.

An employees' association can be a useful, valuable thing to all concerned, or it can be meaningless words on a scrap of paper. Which it is depends, in a large measure, upon the extent of the interest and participation of its members.

SEQUEL TO ANCIENT GRECIAN WATER DEVELOPMENT TOLD

(EDITOR'S NOTE: *The following is the second of two articles dealing with the ancient and modern water systems of the city of Athens, written by the man who was in charge of the work of rehabilitating the supply of the Greek metropolis. The climatic and topographical parallel between Greece and Southern California makes them of prime interest to workers on the modern Colorado River Aqueduct.*)

By R. M. MERRIMAN
Superintendent, Coachella Division

The new Athens Aqueduct, mentioned in a previous article describing the ancient Hadrian Aqueduct, is part of a new water supply system for the City.

This new system includes a dam 980 feet long and 175 feet high for impounding the waters of two mountain streams twenty miles northeast of the City. This dam is known as the Marathon Dam on account of its proximity to the famous battlefield of Marathon where the Greeks repulsed the Persians in 490 B.C. From this spot the original Marathon run was made to Athens, bearing the news of victory. This runner passed near the site of the dam and stopped for a drink at a spring which now empties its waters into the Marathon reservoir. The dam was constructed entirely of white marble of the same kind as used by the Greeks in the construction of their ancient temples and sculptures. It is a beautiful structure and as far as is known is the only marble dam in the world.

Three Years' Supply

The reservoir created by the dam has a capacity of 11,0000,000,000 gallons (34,000 acre-feet) of water, sufficient for the needs of the City for nearly three years if there should be no rainfall whatever. The reservoir was entirely filled before the work was completed.

The anepholes mosquito (the carrier of malarial fever) is very common in Greece and it was feared that the small bays of the lake would form favorable breeding places for this pest. In order to combat this danger it was suggested that we plant in the lake some "Gambuzi," a small fish that lives on the mosquito larvae. About 200 of these fish were imported from Italy and before the end of the first summer they had increased to millions. The Gambuzi did a good job as there were *no* mosquitoes about the Marathon lake.

16 Miles of Tunnels

From the reservoir the water is led to the City by an aqueduct consisting of about 16 miles of tunnels and pipe line. The most important section of this Aqueduct is the Boyati tunnel, 8.25 miles in length. A section of this tunnel was shown in a previous issue of Aqueduct News.

Approximately half of the length of this tunnel was excavated through clay and conglomerates, most of which was removed with pneumatic spaders without the use of explosives. Some seepage of water was encountered, the total maximum amounting to about 300 gallons per minute. The other half of the tunnel was through badly broken schists and marbles in which considerable water was found. One flow amounted to nearly 5,000 gallons per minute for a short time.

Four Years' Work

The entire tunnel was lined with precast concrete blocks, which generally also took the place of timber support. Grouting was carried on at the same time so that the tunnel was completed as it advanced.

It required four years to complete the tunnel, driven from two portals. Maximum rates of progress exceeded 1000 feet per month, but green labor and difficult water conditions made such rates of progress the exception. There are no miners in Greece and pneumatic drills were unknown, so we were at "school" for the first six months. By the time the job was finished, however, there had been developed as capable a crew of tunnel men as could be found anywhere.

Four Zones

The aqueduct terminated at the outskirts of the City in a filtration plant of 20,000,000 gallons daily capacity and a covered distribution reservoir containing one day's supply. A complete new distribution system comprising 600 miles of cast iron mains was laid in the city streets. On account of the topography the city was divided into four zones so as to maintain water pressures within reasonable limits. Pressure reduction was effected by the use of reservoirs having capacities of 200 to 300 thousand gallons. A high service zone, comprising about 10% per cent of the city required pumping to deliver the water.

Aside from the many interesting engineering and construction problems en-

(Continued on Page 8)

EMPLOYEES' BOARD OF CONTROL MEMBERS TO BE ELECTED SOON

Election of representatives to the Board of Control of the Metropolitan Water District Employees' Association will be held within the next two weeks under provisions of the newly amended Association constitution, according to an announcement of the present Board.

The election follows action taken at the incumbent Board's last meeting, amending the constitution in such a manner as to give the various employee groups within the large District organization more direct representation and control of their purely local affairs.

During the early years of the Colorado River project all surveys and investigations were carried on by the Department of Water and Power of the city of Los Angeles. The employees of the Department had formed an Employees' Association in 1927, whose most important function perhaps was to contract for group insurance. All of the employees of the Department working on the Colorado River project were members of this association, and most of them took out group insurance.

When the Metropolitan Water District of Southern California was formally separated from the Department of Water and Power on May 1, 1930, the employees on the Colorado River project of the Department, who came over to the District, at once set about the formation of an Employees' Association for the District, similar to the Department Association in some respects, with almost identical objects and purposes, particularly in the matter of group insurance and welfare work.

The following questions and answers may help to explain what the Association is, who belongs, and how it functions.

Who are members of the Employees Association?

"Every employee of the Metropolitan Water District shall be deemed a member of the Association."—Article I.

What are the objects and purposes of the Association?

They are:

"1. To promote the general good of The Metropolitan Water District of Southern California and of its employees;

"2. To encourage an exemplary discharge of duties on the part of such employees and to discourage that which tends to bring disrepute upon or subvert good order and discipline within the Metropolitan Water District organization;

"3. To promote loyalty to one another among such employees and to such District and to encourage the practice of the highest principles of conduct among such employees in their relations with the Metropolitan Water District Board and the public; and

"4. To enter into such agreements and contracts for the benefit of the Association, or its members, regarding life and other forms of insurance, sick benefits, welfare work, and related matters, as may be approved by a majority of the Board of Control."—Article II.

Who has power to act for the Association?

"The powers of the Association shall be exercised and its business managed by a Board of Control, with full power to act for the Association. Such Board shall be authorized to do all things necessary or convenient for carrying out the objects and purposes of the Association."—Article III, Section 1.

Who are members of the Board of Control under the new constitution?

"The Board of Control shall consist of two representatives from each of the following groups, which groups shall be governed by a Governing Board.

I. Los Angeles Offices and Distribution System Engineering;

II. Banning Headquarters and Main Aqueduct Engineering; and

III. District Construction forces.

"These representatives shall be the President and Secretary of the Governing Board of the group represented. Each representative shall have one vote."—Article III, Section 2.

How are the members of the Governing Boards chosen?

They are elected, each group subdivision having two representatives, one elected each year for a period of two years. The subdivisions of each group are as follows:

"I. LOS ANGELES OFFICES AND DISTRIBUTION SYSTEM ENGINEERING:

1. Accounting, Controller, Disbursing, Personnel, and Right of Way;
2. Chief Engineer, Construction, Legal, Executive, and Purchasing;
3. Design, Distribution, Electrical and Mechanical;
4. Miscellaneous Activities, Labor Employment, Examining, and Garage; and
5. Each Distribution Field Division as set up in future organization.

"II. BANNING HEADQUARTERS AND MAIN AQUEDUCT ENGINEERING:

Banning Headquarters; Division No. 1; Division No. 2; Division No. 3; Division No. 4; Division No. 5; and Division No. 6.

"III. DISTRICT CONSTRUCTION FORCES:

Yellow Canyon Camp; Fargo Camp; Berdoo Camp; Pushawalla Camp; Thousand Palms Camp; Wide Canyon Camp; Long Canyon Camp; Little Morongo Camp; Indio Warehouse; and other permanent construction camps as, if, and while operating."—Article III, Section 3.

May representatives be re-elected or recalled?

"A representative may be re-elected. He may be recalled by a two-thirds vote of his group."—Article III, Section 4.

What are the duties of the Governing Board?

"The Governing Board shall control the activities of its group and shall handle its own recreational or benefit funds."—Article III, Section 5.

That is—they shall organize and manage athletic or social functions within its group so long as it does not interfere with existing organization and recreational activities managed and sponsored by the District administration. The rules for the conduct of elections and the group insurance shall be prescribed by the Board of Control.—Article III, Sections 5 and 6.

How may the new constitution be amended:

The old constitution could be amended by a two-thirds vote of the Board of Control. The rules for the amendment are given in Article VII which follows.

"Amendment of the Constitution and By-Laws may be made by a two-thirds vote at a regular meeting of the Board of Control; provided the proposed amendment has been presented at a previous regular meeting. The amendment must be submitted to the members of the Association for ratification. An affirmative vote of two-thirds of all ballots cast shall be necessary for the adoption of any amendment."

FIRST COMPLETED AQUEDUCT UNIT ALREADY PUT TO USE

Citizens of Pasadena put to use, on Sunday, May 27, the first completed unit of the Colorado River Aqueduct system, the newly dedicated Morris Dam.

On that day waters stored behind the structure in San Gabriel Canyon were turned into the city's mains and delivered to Pasadena homes, gardens, and business houses.

The new dam will be used by Pasadena as a part of its municipal water system until completion of the aqueduct, at which time the structure will be taken over by the Metropolitan Water District as a storage reservoir for Colorado River water, destined for Pasadena and its sister cities in the District.

Honors Morris

At least 500 persons, including representatives of the Metropolitan Water District, were present on Saturday, May 26, when the name of the new structure was changed from Pine Canyon Dam to Morris Dam in honor of its designer and builder, Samuel B. Morris, chief engineer and general manager of the Pasadena Water Department.

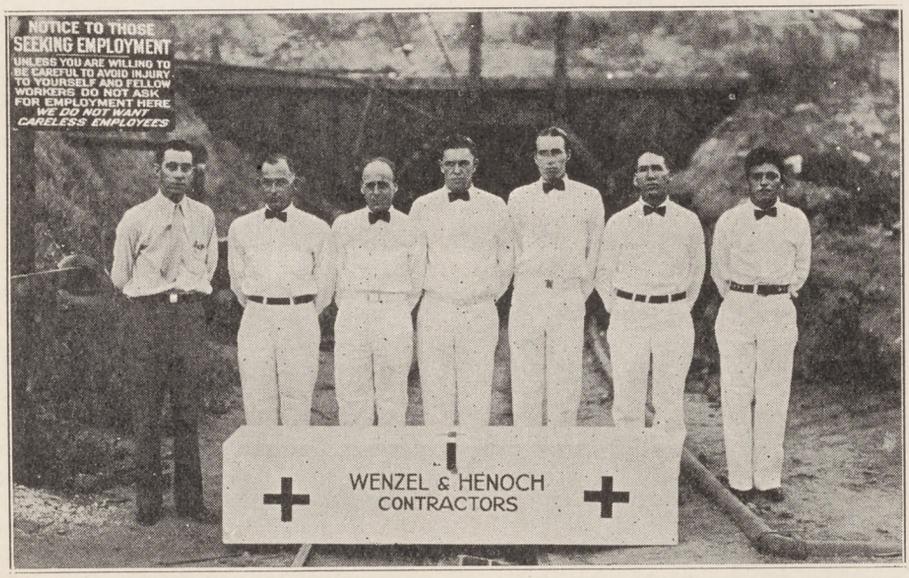
Herbert Hoover, former president of the United States and himself a famous engineer, made the dedicatory speech. "On behalf of those far-seeing leaders of this community, the engineers whose skill has brought this plan to practical realization, and the community which has given to them their loyal support, I dedicate this great work to the services of a hundred generations of Americans who will receive its blessings," he said.

Among those who attended the dedication were a delegation of District directors, headed by Chairman W. P. Whitsett, and a large group of members of the District staff. Both Mr. Whitsett and Director Franklin Thomas of Pasadena spoke briefly. The District directors and members of the engineering staff present, including Assistant General Manager Burkholder and Assistant Chief Engineer Hinds, were introduced from the platform.

775 Feet Long

Morris Dam is a solid mass of 446,000 cubic yards of concrete. Two hundred and forty-five feet above streambed, it is 775 feet long across its crest and has a maximum thickness of 277 feet. Behind it will be stored 37,980 acre feet of water.

It stands completed as the climax of two years of progress. Constructed by the city of Pasadena, under permit from the State Division of Water Resources for storing flood water for use in Pasadena, it represents an investment of $7,525,000. This figure, however, includes certain appurtenant works to be used exclusively by the city of Pasadena, making the cost of the dam to the Water District approximately $1,000,000 under that amount.


NOTICE TO THOSE SEEKING EMPLOYMENT
UNLESS YOU ARE WILLING TO BE CAREFUL TO AVOID INJURY TO YOURSELF AND FELLOW WORKERS DO NOT ASK FOR EMPLOYMENT HERE
WE DO NOT WANT CARELESS EMPLOYEES
WENZEL & HENOCH
CONTRACTORS

The winners! Here is the first-aid team, from the west portal of San Jacinto tunnel, which covered itself with glory in the State First-Aid Contest last month. (Left to right) S. M. Jarrett, instructor; Dick Bray, Ellis Beeson, captain; Bert Rice, Leslie Rice, Otho Spence, and Warren Hackler.

Safety On the Aqueduct

By T. W. OSGOOD
Safety Engineer

The first-aid team of the Wenzel & Henoch Construction Company, from the west portal of the San Jacinto tunnel, won high honors at the State First-Aid Contest which was held at the Jonathan Club in Los Angeles on May 17. The contest was sponsored by the California Safety Society.

The Wenzel & Henoch team brought home a large loving cup, the trophy being awarded to the best team in the Mining Division. The cup was formerly held by the Hetch Hetchy team of San Francisco.

The team entered by Wenzel & Henoch Construction Company represented the Metropolitan Water District tunnels in the contest. This was the first time that the team had participated in contest work, and although they had trained only about six weeks, they made a remarkable showing, considering the fact that they were competing with the best trained teams in the state.

The men were trained by S. M. Jarrett, safety engineer for the Industrial Indemnity Exchange. The personnel of the team included:

Ellis Beeson, captain
Dick Bray
Bert Rice
Leslie Rice
Otho Spence
Warren Hackler

Judges were from the United States Bureau of Mines, and the contest was sponsored by E. F. Bullard. Prizes were distributed at a banquet held on May 18.

Rankings for the first seven places in the general competition were as follows:

1st—Shell Oil Company.
2nd — Southern California Edison Company.
3rd—Redwood City Fire Department.
4th—Portland Cement Company.
5th—Wenzel & Henoch Construction Company.
6th—Los Angeles Dept. of Water and Power.
7th—Richfield Oil Company.

The boys from the west portal attained a grade of 95 per cent in this general competition, and they and their instructor are to be congratulated for their enviable record in such fast and experienced company.

DIRECTORY

BOARD OF DIRECTORS

W. P. Whitsett, Chairman
Franklin Thomas, Vice-Chairman
S. H. Finley, Secretary

Anaheim.....O. E. Steward
Beverly Hills.....George R. Barker
Burbank.....J. L. Norwood
Compton.....William H. Foster
Fullerton.....Walter Humphreys
Glendale.....Frank P. Taggart
Long Beach.....William M. Cook
Los Angeles.....I. Eisner
Los Angeles.....Perry H. Greer
Los Angeles.....Walter A. Ham
Los Angeles.....D. W. Pontius
Los Angeles.....John R. Richards
Los Angeles.....Victor H. Rossetti
Los Angeles.....W. P. Whitsett
Pasadena.....Franklin Thomas
San Marino.....J. H. Ramboz
Santa Ana.....S. H. Finley
Santa Monica.....Arthur A. Weber
Torrance.....Charles T. Rippy

Charles H. Toll, Treasurer
D. W. Pontius, Controller

GENERAL STAFF

General Manager and Chief Engineer.....F. E. Weymouth
Asst. General Manager.....J. L. Burkholder
Asst. Chief Engineer.....Julian Hinds
General Counsel.....James H. Howard
Asst. Controller.....J. M. Luney
General Superintendent.....James Munn
Chief Elec. Engineer.....J. M. Gaylord
Construction Engineer.....J. B. Bond
Asst. to Gen. Mgr.....Don J. Kinsey

DIVISION ENGINEERS

Division 1.....R. C. Booth
Divisions 2 and 3.....John Stearns
Division 4.....R. B. Diemer
Divisions 5 and 6.....B. C. Leadbetter

SUPERINTENDENTS

Colorado River, Copper Basin and Whipple Mt. Tunnels, Walsh Construction Co., F. T. Huntington, Gen. Supt.; W. A. Huntington and E. A. Hatch, Tunnel Supts.

Coxcomb Tunnel and Iron Mt. shaft, Winston Bros., E. A. Bernard, Gen. Supt.; F. T. Hillman and R. B. Johnson, Tunnel Supts.

Iron Mt. Tunnel, West Portal, Utah Constr. Co., Ben Arp, Gen. Supt.

East Eagle Mt. Tunnel and West Eagle Mt. Tunnel, east portion, Broderick & Gordon, F. E. Stokes, Gen. Supt.

West Eagle Mt. Tunnel, west portion L. E. Dixon and Bent Bros., P. C. Guinn, Gen. Supt.

Hayfield Tunnel No. 1, Hunkin & Conkey Constr. Co., G. B. Hoag, Gen. Supt.; F. Backlund, Tunnel Supt.

Hayfield Tunnel No. 2, Shofner & Gordon, H. E. Warden, Gen. Supt.

Cottonwood Tunnel, J. F. Shea Co., Inc., Gilbert Shea, Gen. Mgr.; Joe Bonner and Carl Nelson, Tunnel Supts.

Mecca Pass Tunnels, Morrison-Knudsen, S. A. Dahlberg, Gen. Supt.; C. A. Griffen, Asst. Supt.

Coachella Division, R. M. Merriman, Division Supt.

Yellow Canyon Adit, E. Coachella Tunnel—
District Force Account.....W. L. Taylor

Fargo Adit, East Coachella Tunnel—
District Force Account....J. H. Manwaring

Berdoo Adit, East Coachella Tunnel—
District Force Account.....F. A. Weller

Pushawalla Adit, East Coachella Tunnel—
District Force Account....C. J. Kavanagh

Thousand Palms—
District Force Account.....D. L. Reaburn

Wide Canyon—
District Force Account.....John Jackman

Long Canyon—
District Force Account....E. E. McCabe,

Little Morongo—
District Force Account.....R. L. Bryant,

Whitewater Tunnels, West Constr. Co., H. E. Carleton, Gen. Supt.; Angus MacDonnell, Tunnel Supt.

San Jacinto Tunnel, Wenzel & Henoch, Walter Hoenecke, Gen. Supt.; W. A. Boyd, Walter Baer, and Jack May, Tunnel Supts.

Bernasconi Tunnel, Hamilton & Gleason Co., H. J. King, Gen. Supt.

Valverde Tunnel, Dravo Contr. Co., H. C. Richardson, Gen. Supt.; Dean Luther, J. R Glaeser, and Fred Youmans, Tunnel Supts.

SUNDAY SCHOOL AT EAGLE MOUNTAIN

Safety Measures On Aqueduct Are Praised

High praise was accorded last week by T. A. Reardon, director of the State Department of Industrial Relations, to safety measures adopted by the Metropolitan Water District on the Colorado River Aqueduct project.

"Executives are taking a live interest in accident prevention and are now beginning to receive returns for their efforts of the past few months," Mr. Reardon said in an interview appearing in the Los Angeles Times.

"The accidents, in frequency and severity, are being reduced and with no delay in the work.

"A mine rescue station with trained crews has been established and an attempt is being made to train the personnel 100 per cent in first aid. The labor turnover is large and many men with no previous underground experience are employed, due to the requirement that employees, with certain exceptions, must be residents of the District."

HAVANAS DISTRIBUTED

Returning from a week-end vacation recently, with a box of cigars in his hand and a new look on his face, Lee M. Greenleaf, Little Morongo Siphon inspector, announced that he had taken the nuptial vows and was no longer a single man. His bride was formerly Jane Mercer of Los Angeles. The happy couple are residing in Banning.

Sunday School Is Organized At Eagle Mt.

Nine o'clock on Sunday mornings at Broderick & Gordon's Eagle Mountain Camp means Sunday school for the eighteen children of the camp's family colony.

With the help of Elmer Gandy and Frank A. Kehrli, of the American Sunday School Union, the school was organized almost two months ago. The picture above is the first to be taken of the group.

Mrs. Henry Woods was elected superintendent; Mrs. Tom Evans, secretary, and Mrs. Charles Williams, treasurer. The teachers of the three classes are Mrs. Albert Connell for the adults, Mrs. Tom Evans for the juniors, and Mrs. Lester Rowe for the primary class.

Reports from the field indicate that there is almost a perfect attendance of the eighteen children in the colony, with all twelve families represented.

Since no building is available for the use of the school, meetings are held out of doors at 9 a. m.

4 TO 5 DEFEAT

In a bitterly contested game, the Los Angeles office All-Star baseball team went down to defeat last week at the hands of the Design and Construction Division of the Los Angeles Water and Power Department by a score of 5 to 4. The Electrical-Mechanical Division still retains its lead in the M. W. D. League by winning four straight games.

BEST PROGRESS
This Period
Rock Tunnels-Pushawalla west, 797 ft.
Gravel Tunnels-Whitewater No. 2, 910 ft.

TUNNEL PROGRESS

MAY 1-31, 1934
Tunnel Excaved to Date, 26.34 Miles

BEST WEEK'S RECORD
This Year
Rock Tunnels-Cottonwood East, 227 ft.
Gravel Tunnels-Whitewater No. 2, 233 ft.

TUNNELS ON CONTRACT	Length in feet	Number of Shifts	EXCAVATION PROGRESS IN FEET: Average Per Shift	This Period	Total to date
Walsh Constr. Co.					
COLORADO RIVER	(5515)				
West Portal	5515				0
COPPER BASIN, No. 1	(689)				
West Portal	689	93	7.0	649	676
COPPER BASIN, No. 2	(11,580)				
East from adit	1878			0	1878
Adit	330			0	330
West from adit	9702	93	6.9	640	3500
WHIPPLE MT.	(32,265)				
East from adit	18,352	93	6.3	588	3456
Adit	924			0	924
West from adit	13,913	84	5.0	419	2884
Winston Bros.					
IRON MT.	(39,759)				
East from shaft	9844	81	4.7	377	1406
Shaft	165			0	165
West from shaft	13,743	81	8.4	683	3739
Utah Constr. Co.					
IRON MT.					
West Portal	16,172	93	7.4	690	6470
Winston Bros.					
COXCOMB	(17,795)				
East Portal	8765	81	7.2	581	4662
West Portal	9030			0	0
Broderick & Gordon					
EAST EAGLE MT.	(9,442)				
West Portal	9442			0	0
WEST EAGLE MT.	(26,494)				
East from adit	7871	81	5.8	471	1348
Adit	2008			0	2008
West from adit	7974	80	0.1	8	873
Dixon & Bent					
WEST EAGLE MT.					
West Portal	10,649	81	8.3	671	4488
Hunkin & Conkey					
HAYFIELD, No. 1	(9677)				
East from adit	5317	54	6.1	328	1364
Adit	511			0	511
West from adit	4360	54	6.6	356	1024
Shofner & Gordon					
HAYFIELD, No. 2	(5375)				
West Portal	5375	54	5.5	297	2228

TUNNELS ON CONTRACT	Length in feet	Number of Shifts	EXCAVATION PROGRESS IN FEET: Average Per Shift	This Period	Total to date
J. F. Shea Co.					
COTTONWOOD	(20,105)				
East Portal	10,114	81	8.3	673	5497
West Portal	9991	81	7.8	633	5189
Morrison-Knudsen					
MECCA PASS	(5,940)				
No. 1, West Portal	338	46	4.9	225	338
No. 2, West Portal	997	8	1.9	15	22
No. 3, East Portal	4605	81	9.7	782	4049
West Constr. Co.					
WHITEWATER	(10,206)				
No. 1, West Portal	2060	0	0	0	35
No. 2, East Portal	8146	81	11.2	910	5683
Wenzel & Henoch					
SAN JACINTO	(67,415)				
East from Cabazon	8553	90	1.6	142	554
Cabazon shaft	246			0	246
Cross drift	935			0	935
West from Cabazon	22,839	93	6.7	620	1621
East from Potrero	20,589	66	1.3	83	83
Potrero shaft	796	33	—	—	796
West from Potrero	6712	63	1.4	86	86
West Portal	8722	93	2.6	246	1529
Hamilton & Gleason					
BERNASCONI	(6220)				
East Portal	6220	58	7.0	406	3382
Dravo Contr. Co.					
VALVERDE	(38,077)				
East from Shaft 1	1452	39	4.5	177	1452
Shaft 1	64			0	64
West from Shaft 1	1525	68	0.8	55	813
East from Shaft 2	5400	87	2.7	239	3284
Shaft 2	204			0	204
West from Shaft 2	5400	87	3.7	322	3269
East from Shaft 3	6950	84	0.8	68	2450
Shaft 3	192			0	192
West from Shaft 3	6950	87	4.8	418	3002
East from Adit	5117			0	0
Adit	406	10	3.8	38	38
West from Adit	5283			0	0
Total Excav. Contract Tunnels exclusive of Adits and Shafts	306,554	2396	5.37	12,858	82,334
(In Miles)	58.06			2.44	15.59

TUNNELS ON FORCE ACCOUNT

	Sched.					
EAST COACHELLA TUNNEL		(96,610)				
Yellow Canyon Adit		686			0	686
East from adit	1	10,204	81	8.1	657	5346
West from adit	1	10,076	81	9.3	754	5026
Fargo Canyon Adit		891			0	891
East from adit	2	11,850	82	7.8	639	4535
West from adit	2	15,200	81	5.7	458	4265
Berdoo Canyon Adit		2042			0	2042
East from adit	3	15,824	81	9.8	791	5462
West from adit	3	12,456	81	9.6	774	5157
Pushawalla Canyon Adit		2935			0	2935
East from adit	4	10,186	81	7.1	576	2940
West from adit	4	10,814	81	9.8	797	3313
WEST COACHELLA TUNNELS		(81,109)				
THOUSAND PALMS						
No. 1, West Portal	5	16,058	81	5.1	412	4905
No. 2, Tunnel	5	3838			0	3838

	Sched.					
WIDE CANYON						
No. 1, E. Portal	5	5122	81	6.0	483	1146
No. 1, W. Portal	6	9183	81	6.8	552	4603
No. 2 Tunnel	6	848			0	848
SEVEN PALMS		(16,730)				
E. Portal	6	8390	81	6.1	494	3928
W. Portal	7	8340	77	5.4	415	436
LONG CANYON		(15,240)				
E. Portal	7	8360	77	5.3	405	480
W. Portal	8	6880				0
BLIND CANYON		(6,788)				
E. Portal	8	—				0
W. Portal	8	6788	81	4.3	345	356
MORONGO No. 1		(5,512)				
E. Portal	8	5512	49	3.4	169	169
W. Portal	8	—				0
MORONGO No. 2		(1790)				
E. Portal	8	1790				0
W. Portal	8	—				0
Total excav. Force Acct. Tunnels excl. of Adits and Shafts		177,719	1257	6.94	8,721	56,753
(In Miles)		33.66			1.65	10.75
Total Tunnel Excavation (Miles)		91.72		5.88 ft.	4.09	26.34

Heading excavation is counted as two-thirds of full tunnel excavation.

NEWS FROM FIELD AND OFFICE

Superintendent McCabe at Long Canyon, after having read Mr. Merriman's article on the Hadrian Aqueduct in the May 5th issue of the Aqueduct News, noted the wonderful progress made by man without the aid of machinery in the construction of that aqueduct some 1800 years ago. He decided to show the other superintendents on tunnel construction that man is still able to make good progress without the aid of machinery. At Long Canyon during the first 21 days of May the advance in the two headings was 520 feet in 19 days, or a daily progress of 27.5 feet with the use of two muck cars and a dilapidated locomotive. Approximately 50 per cent of the tramming was performed by hand.

* * *

Fourteen 12-foot sections of the Little Morongo Siphon were placed during the week ending May 26, making a total of 208 feet of pipe in place. On the 26th the 45 degree angle at the toe of the west slope was poured. The angle is 28 feet long and required approximately 55 cubic yards of concrete. A ramp has been exvated to roll the precast pipe down at the east end of the ditch.

* * *

Mr. Gilbert Shea, Vice President of the J. F. Shea Co., Inc., contractors on the Cottonwood Tunnel, has purchased a home in Los Angeles. Mrs. Shea and family have been living there during the past year. Mr. Shea states that they are thrilled with Southern California and know that it is a good place to live and that it will be a better place when the water is received from the Colorado River Aqueduct.

* * *

June First saw completion of the camp and the setting of practically all of the equipment at Little Morongo. Three shifts are operating in each of the headings.

* * *

David May of the Banning office is to be congratulated upon his success in winning the first prize of $150 in the scramblegraph contest conducted by the Los Angeles Times.

* * *

R. W. Ramp of Pittsburgh has been appointed general manager on the Dravo Contracting Company's Valverde tunnel job.

* * *

Dr. F. E. Keep has been appointed resident physician on the Valverde job, succeeding the late Dr. Alex Conrad.

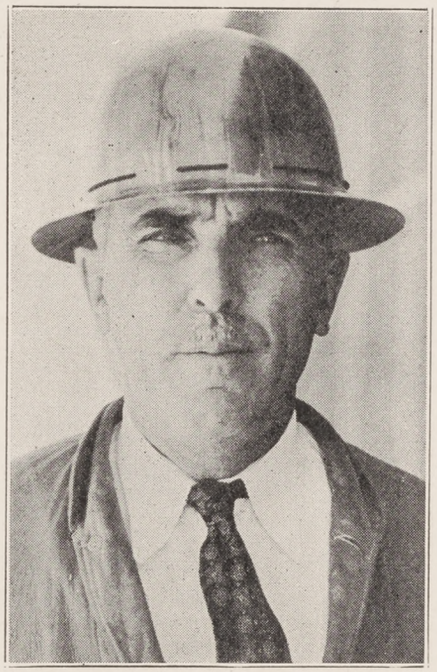
AQUEDUCT TEMPERATURES
May 13 to 26, Inclusive

	Max.	Min.
Div. 1	106°	67°
Div. 2 & 3	105°	58°
Div. 4	103°	57°
Div. 5 & 6	97°	40°

A new and very respectable speck appeared last week on the postal map of these United States. It was Berdoo Camp, California. The new post office, which is to handle mail for all eight camps on the Coachella Division, will be presided over by Postmaster W. D. Parsons, formerly employed by the Metropolitan Water District at Yellow Canyon.

* * *

Contract No. 100 with Clyde W. Wood for the construction of Gene Draw Road to the site of the aqueduct intake was completed on May 23. This contract included two other schedules which were completed on January 22.



The solemn looking gentleman above is H. E. Carleton, general manager on the West Construction Company's Whitewater Tunnel job. The solemnity, it is understood, is just a pose. Mr. Carleton, in reality, is a very cheerful fellow these days—and well he may be, as a look at the box in the upper right hand corner of the opposite page will reveal.

Work has been comenced by crews of the Dravo Contracting Company on a 406-foot inclined adit, being driven on a 28 per cent grade, to intersect the Valverde tunnel line one mile from its western end. Excavation of 5283 feet of tunnel will be carried forward from the adit to the west, and 5117 feet east. Vertical shafts are being used at the other three access points on the tunnel, the total length of which is 38,077 feet.

* * *

If D. L. Reaburn, superintendent at Thousand Palms, ever tires of driving tunnel, he will take up osteopathy or accounting or singing—anything, in fact, except automotive engineering. This fact was brought out last month when Superintendent Reaburn's car refused to start just as he was leaving camp for a superintendents' meeting at Berdoo. He diagnosed the difficulty as ignition trouble, and secured a tow over to the Berdoo garage. After the meeting, he found that the boys in the garage had fixed all his ignition trouble by putting a few gallons of gas in the Ford's tank.

* * *

All aqueduct tunnel driving records were broken, during the week ending May 26, when West Construction Company crews, on Whitewater tunnel No. 2, excavated 233 feet of bore, surpassing by six feet the mark established on J. F. Shea Company's Cottonwood tunnel job. This progress was made through soft ground, however, and the Cottonwood advance through rock.

* * *

Another aqueduct marriage will take place on June 16 when Miss Joan McNeil of San Marino becomes the bride of George W. von KleinSmid, a member of Division Engineer Leadbetter's staff. The ceremony is scheduled to take place in the Church of Our Savior at San Gabriel. Von KleinSmid's home is in Los Angeles.

* * *

Walsh Construction Company has completed the erection of the compressor house and steel sharpening house on the Colorado River tunnel job. Installation of equipment is under way.

* * *

G. E. Conkey, president of the Hunkin & Conkey Construction Company, was a visitor for several days last week on his firm's Hayfield Tunnel No. 1 job.

* * *

It has come to our notice that there have been new arrivals in the families of Ben A. Eddy and "Dutch" Holland, engineers on Division No. 5.

New Medical Rules Approved By Board

On May 18, 1934, the Board of Directors approved new regulations covering medical attention and service for employees of the Metropolitan Water District. A copy of these regulations has been posted on the bulletin board and a copy may be obtained from division heads.

Attention is especially called to the following provisions:

8 (a) Where District physicians are available, employees desiring medical service are directed to consult such District physician who may, when necessary, issue the proper authorization for medical attention to an outside physician or hospital.

9 (d) Service and medical attention to be provided under these regulations shall *not* include injuries received while operating or riding in private automobiles.

9 (e) Service and medical attention shall not include injuries or sicknesses incurred when not on active duty at place remote from employee's headquarters or places of work.

(The above rule shall be specifically defined to limit medical service to the city in which the employee retains his residence, to his working place and established routes of travel from one to the other.)

9 (f) Chronic ailments incurred before the employment of any person by the District shall not be treated at the expense of the District, except that after two years' employment the treatment of such cases at the expense of the District will not be denied unless the ailment was noted on the record of the physical examination at the time of employment.

Field employees desiring to receive medical attention should request the division head, division engineer, or tunnel superintendent to issue the necessary order for medical treatment.

Dr. Hugh M. Mason is available to Los Angeles office employees in Room 609 of the Headquarters Building at 306 West Third Street. Employees desiring medical attention should call upon him, who may, when necessary, issue authorization for employee to receive medical attention from an outside physician or hospital.

Spectacular flashover resulting from tests of insulators of the type to be used on aqueduct transmission line from Boulder Dam. This picture is of one of the tests conducted last week in the high voltage laboratory of Caltech.

Aqueduct Insulators Given Tests At Caltech

The million-volt laboratory at California Institute of Technology was the scene, last week, of tests of insulators of the type to be used on the Aqueduct's power transmission line from Boulder Dam.

Insulator strings were subjected to high voltage and observations made on their ability to withstand damage. The picture reproduced above shows the spectacular results of one of the tests, an arc or "flashover" extending from top to bottom of the seven-foot insulator string.

Cooperating with E. W. Rockwell and B. H. Martin of the staff of J. M. Gaylord, chief electrical engineer of the Metropolitan Water District, is Professor Royal W. Sorenson, head of the electrical engineering department at Caltech and consulting engineer for the District.

Sequel to Ancient Greek Aqueduct Is Told

(Continued from Page 2)

countered, this work was of particular interest on account of the historical surroundings, and of the many ancient objects unearthed in the excavations. A marble sarcophagus was found in excavating for one of the reservoirs. Its estimated age was 2,000 years, and upon opening it the body of a woman, seemingly in perfect preservation, was found. After a short exposure to the air, however, the body rapidly crumbled to dust. Marble statues and pottery, dating back 2,000 to 3,000 years, were found only a few feet below the surface of the city streets when excavating for the distribution pipes.

Historical Treasures

Excavation for one of the tunnel camps uncovered several large earthen pots that had been used by workers on the Hadrian Aqueduct 1800 years ago, for containers for their wines and foodstuffs. At the dam site a box of copper coins, 400 years of age, was discovered.

While interesting, the finding of archeological objects was often annoying, as it was necessary to notify the authorities, and nothing could be moved until they appeared and issued instructions. This sometimes took several days, as the Greeks, like our Latin-American neighbors, have the "avrio" (Greek for manana) habit.

Complete Excavation Of Mecca Pass No. 1

Excavation of another aqueduct bore reached completion on May 20 when Morrison-Knudsen Company's crews reached the 338-foot mark on Mecca Pass Tunnel No. 1. The work had been started from the west portal and was continued to the point at which the approach cut to the east portal will be excavated. S. A. Dahlberg is superintendent on the job. The company also has Mecca Pass Tunnels Nos. 2 and 3 under contract.

Track from No. 3 to No. 2 and in the approach cut has been completed. The mucking machine, locomotive, and cars are now on the ground, and excavation has begun.